Highlights from an In-Depth Behavioral Survey on Transformative Technologies in Transportation

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Transportation Technologies

Automation

Mobility-on-Demand

Micro-mobility

Electrification

Connectivity

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Transportation Future?

Automation

Mobility-on-Demand

Connectivity

Increase in VMT, Sprawl and Decrease in Walk, Bike, and Transit Use

Mobility for All and Sustainability

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Study Purpose

Collect a rich set of data across multiple jurisdictions that collects people's travel behavior, attitudes, socioeconomics, perceptions and potential behavior in response to **Mobility-on-demand and Autonomous Vehicles**

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TOMNET: Teaching Old Models NEw Tricks

MISSION: To bring attitudinal information into real-world transportation planning and forecasting

- A Tier 1 University Transportation Center
- Authorized November 2016
- 5-year funding

Survey Team

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TOMNET Transformative Transportation Technologies (T4) Survey

- Phoenix, Atlanta, Austin, and Tampa metro areas

- Summer and Fall 2019 (pre-pandemic)

- Random address-based sample with online instrument

- Comprehensive attitudinal survey on MoD and AV

- Weighted to better represent Census distributions
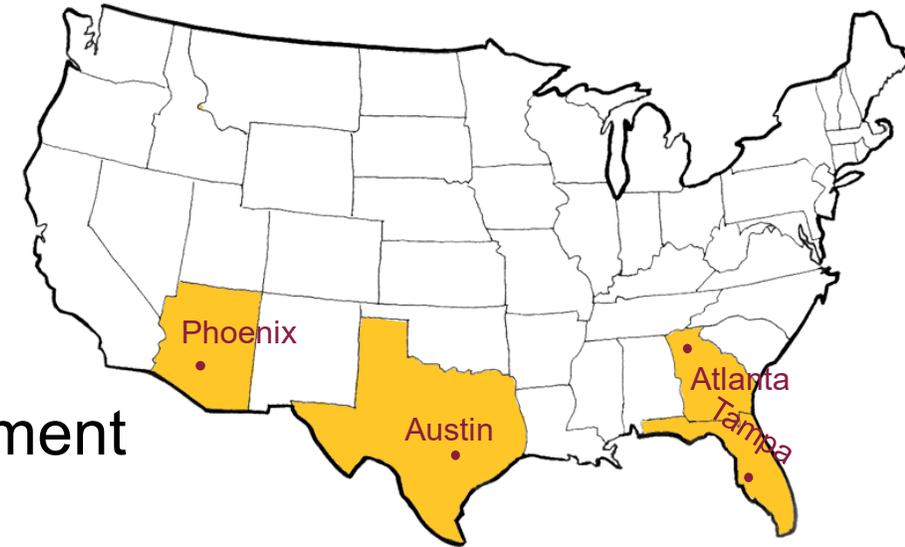
	Phoenix, AZ	Atlanta, GA	Austin, TX	Tampa, Fl	Total
Sample Size	1,027	944	1,127	260	**3,358**
%	30.6%	28.1%	33.6%	7.8%	100%

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Mobility on Demand

Ridehailing and Micromobility

MoD Familiarity and Usage (N=3,358)

Chart legend:
- **Use it weekly** (orange)
- **Use it monthly** (blue)
- **Use it rarely** (green)
- **Familiar but not an user** (yellow)
- **Not familiar** (dark red)
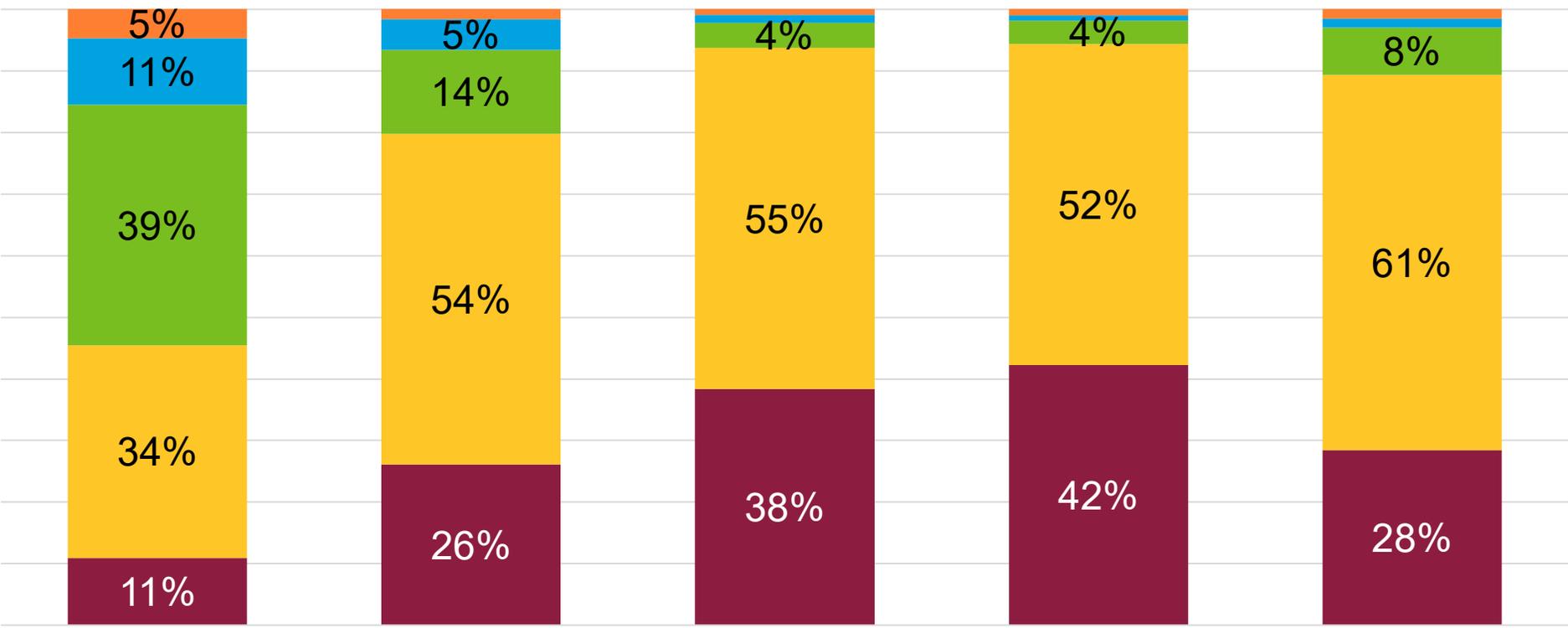
Category	Not familiar	Familiar but not an user	Use it rarely	Use it monthly	Use it weekly
Private ridehailing (e.g., Uber, Lyft)	11%	34%	39%	11%	5%
Shared ridehailing (e.g., uberPOOL, Lyft Share)	26%	54%	14%	5%	
Carsharing (e.g., Zipcar, Share Now)	38%	55%	4%		
Bikesharing (e.g., Jump, Grid)	42%	52%	4%		
E-scooter sharing (e.g., Lime, Bird)	28%	61%	8%		

Last Ridehailing Trips Attributes (N=1,885)

- 54% waited less than 5 min
- Average travel time 21 min
- 47% weekday daytime
- 25% weekend nighttime,
- Top trip purposes:
  - Social/recreational   25%
  - Main commute location   15%
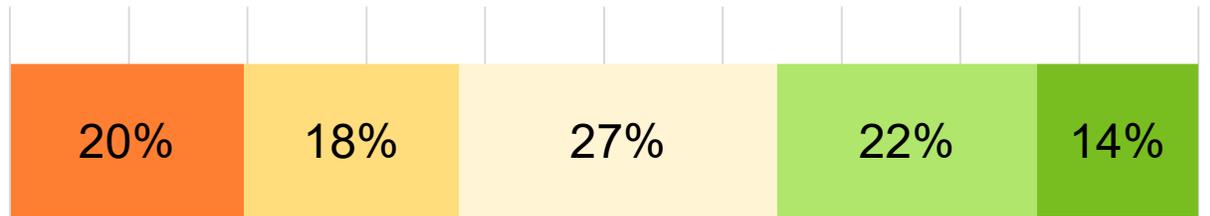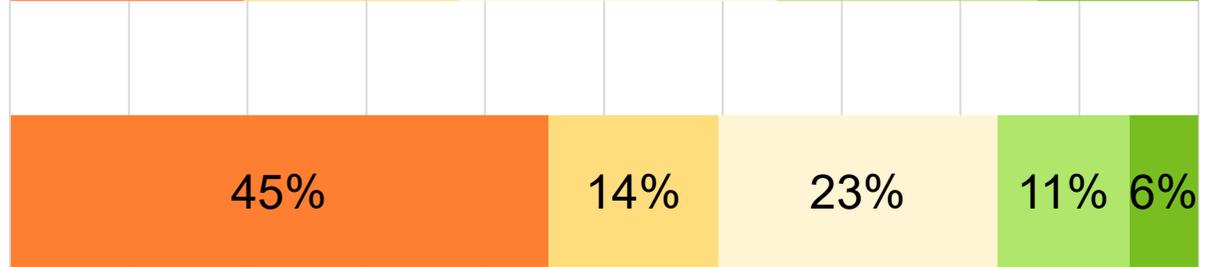 - To access airport   14%

Alternative mode

Taxi 21%

Drive alone 18%

Drive with passengers, 14%

Ride with others 12%

Bus 11%

Personal bicycle or scooter, 2%

Light rail, 2%

Walk, 4%

Other, 6%

I would not have made the trip, 10%

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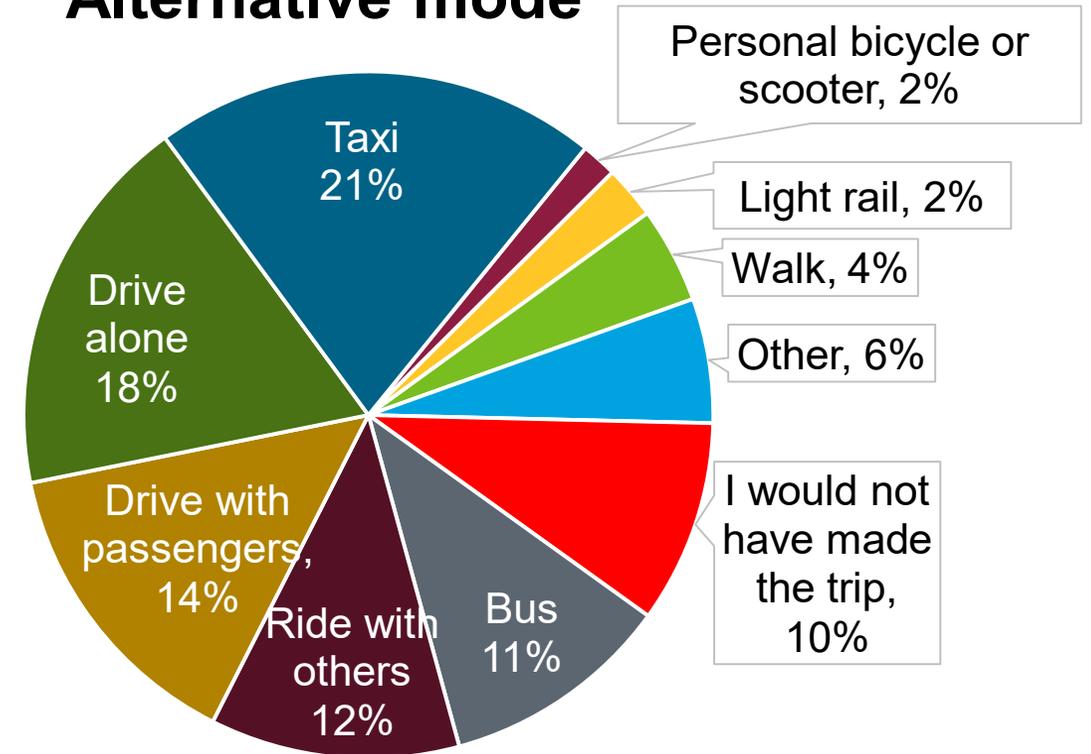
Ridehailing Impacts
Only monthly and weekly users

Legend: ■ Strongly disagree   ■ Somewhat disagree   ■ Neutral   ■ Somewhat agree   ■ Strongly agree

Statement	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
Ridehailing services allow me to live with fewer or no cars. (N=508)	20%	18%	27%	22%	14%
Ridehailing service availability affects where I choose to live, work, and/or go to school. (N=503)	45%	14%	23%	11%	6%
Ridehailing services help me get to/from public transit stops. (N=510)	17%	11%	34%	18%	19%

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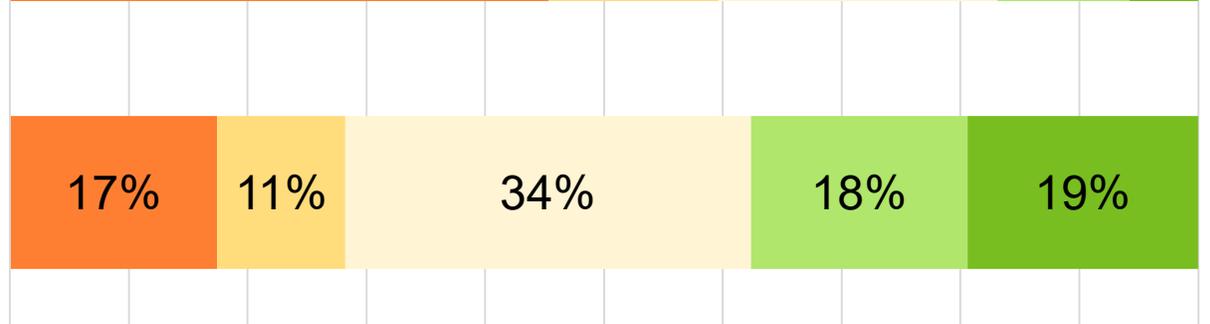
Ridehailing: Willingness to Share

Last actual ridehailing trips* (N=1,219)

- 12% chose to share
- Low income chose to share twice more than high income
- Women chose to share 1.5 times more than men
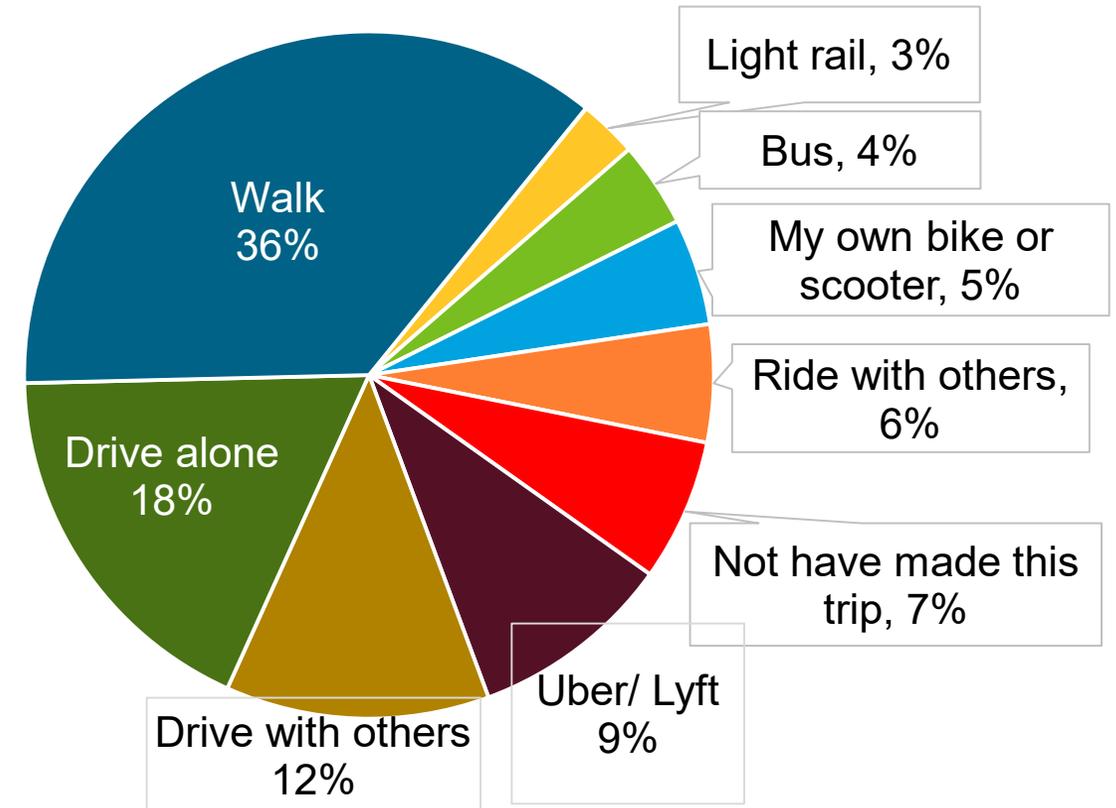- Frequent users chose to share 1.4 times more than infrequent users
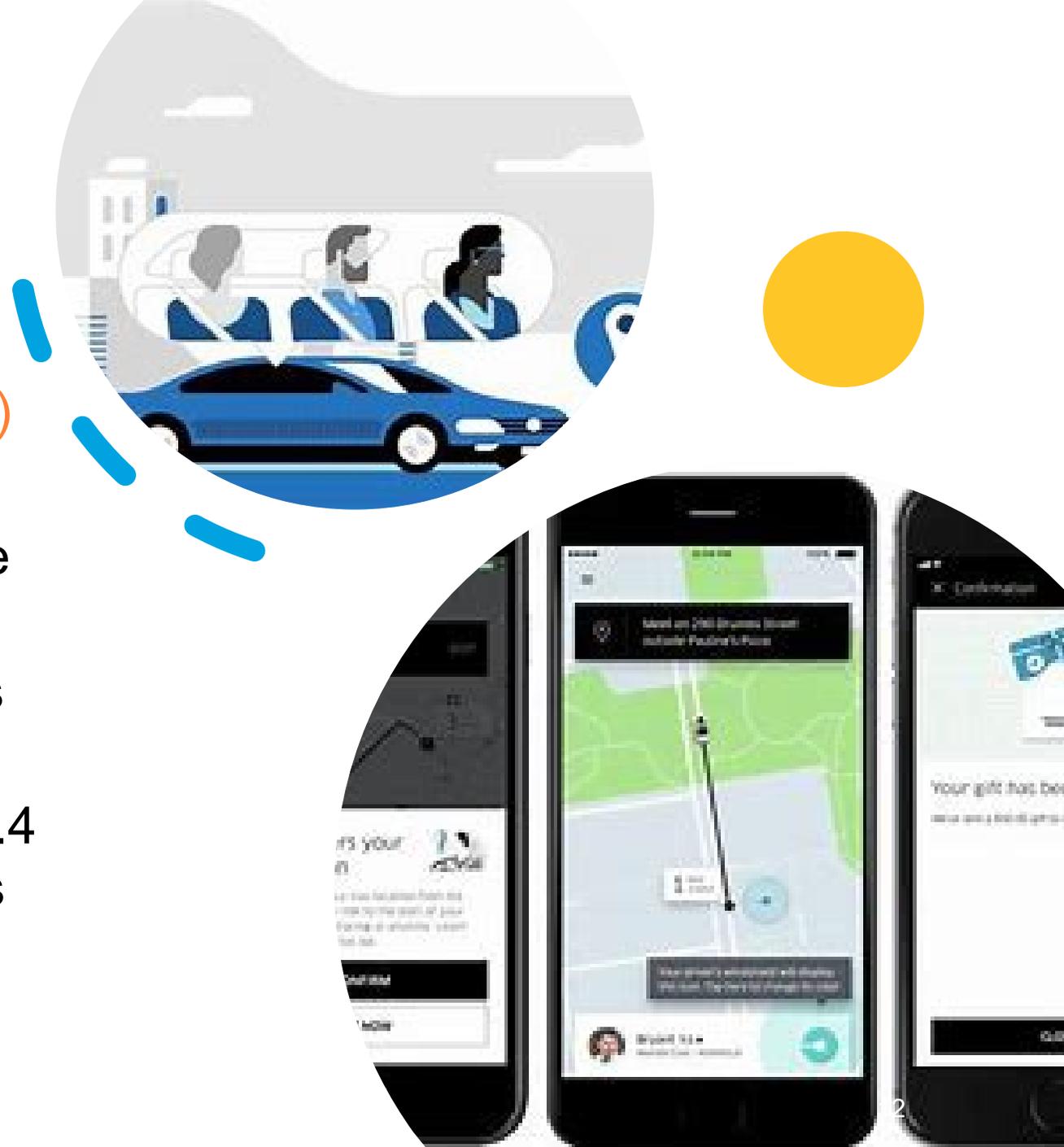
*Shared ridehailing only for Austin and Atlanta

Micromobility Trips (N=380 users)

- 76% used e-scooter service
- 62% of trips were between 1 to 2 mi
- 38% weekday during daytime
- Top trip purposes:
  - 22% to commute location
  - 19% for shopping and errands
  - 7% just to enjoy the new service
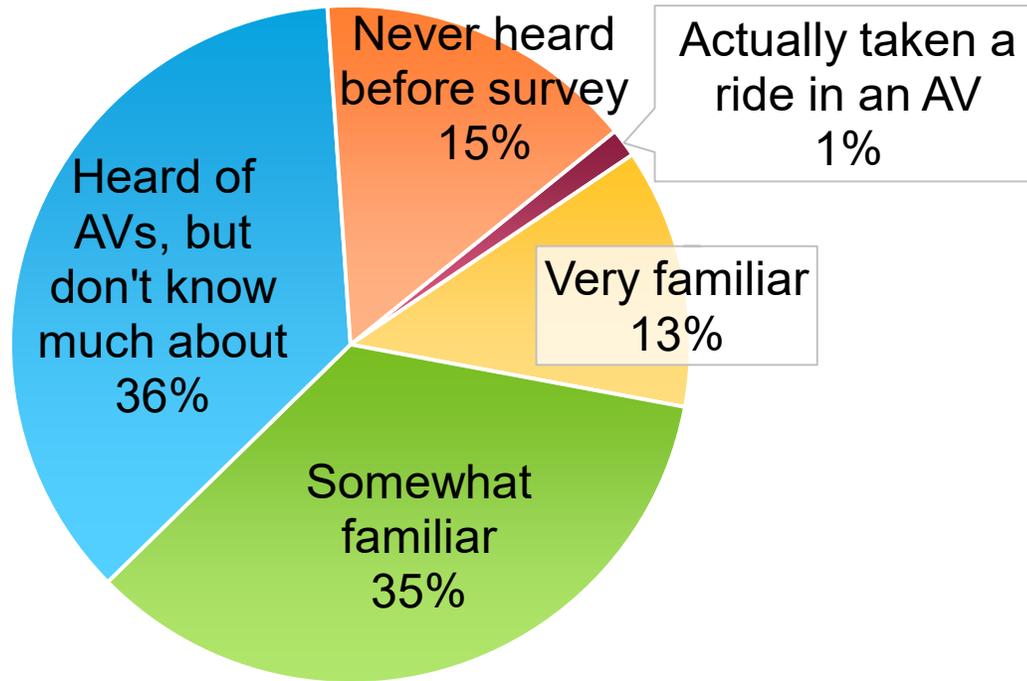
Alternative mode

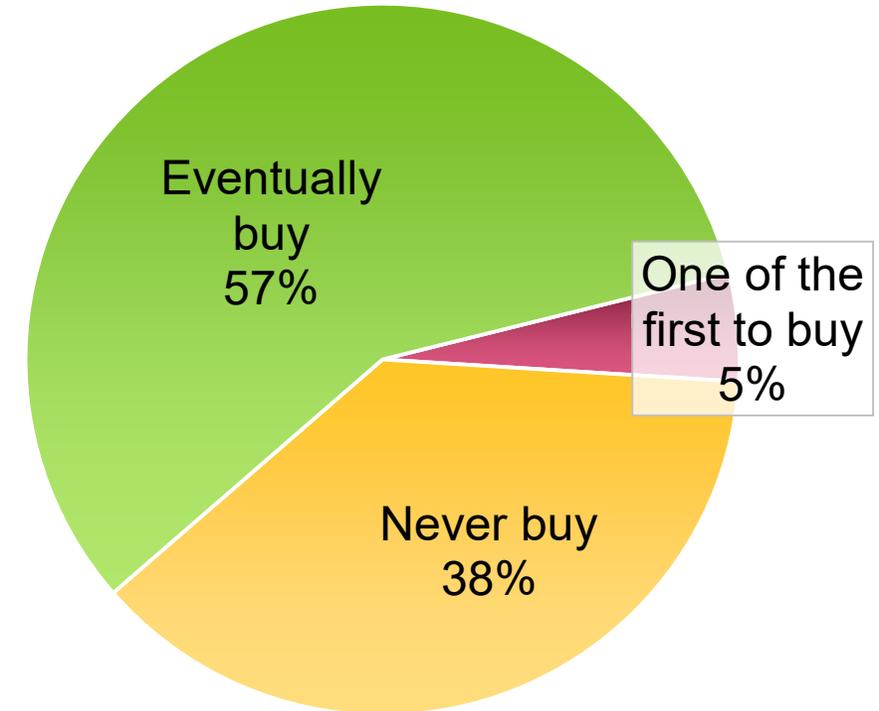Pie chart — Alternative mode:
- Walk 36%
- Drive alone 18%
- Drive with others 12%
- Uber/Lyft 9%
- Not have made this trip, 7%
- Ride with others, 6%
- My own bike or scooter, 5%
- Bus, 4%
- Light rail, 3%

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Autonomous Vehicles

Attitudes and Travel Behavior

Autonomous Vehicles (N=3,356)

FAMILIARITY

- Never heard before survey 15%
- Actually taken a ride in an AV 1%
- Heard of AVs, but don't know much about 36%
- Very familiar 13%
- Somewhat familiar 35%

WILLINGNESS TO BUY

- Eventually buy 57%
- One of the first to buy 5%
- Never buy 38%

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Autonomous Vehicles:
Safety and Sharing Perceptions

■ Strongly disagree   ■ Somewhat disagree   ■ Neutral   ■ Somewhat agree   ■ Strongly agree

Statement	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
I am concerned about the potential failure of AV sensors, equipment, technology, or programs. (N=3331)	6%	8%	17%	35%	33%
I want the ability to take control of the AV at any time during the ride. (N=3331)		6%	18%	33%	40%
I will use AV ridehailing services alone or with coworkers, friends, or family. (N=3358)	19%	10%	25%	32%	14%
I will use AV ridehailing services with other passengers I don't know. (N=3358)	29%	23%	27%	15%	5%
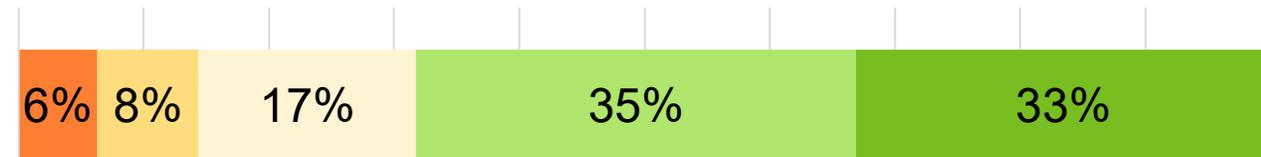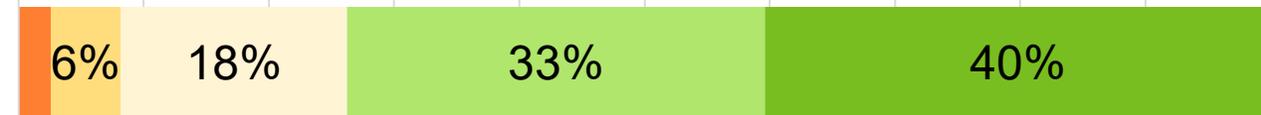
Commute Time Changes with AV
(N=2,221)

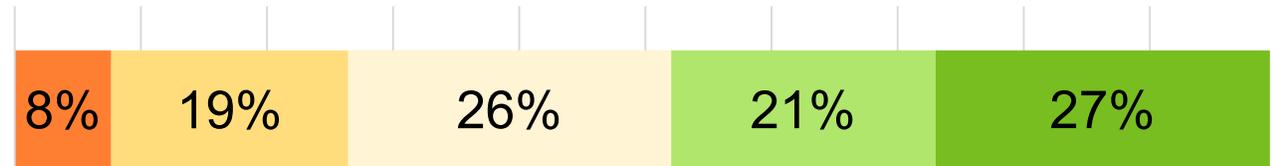How much longer would you be willing to commute in an AV (compared to your current commute)?

Pie chart:
- Up to 5 additional minutes: 21%
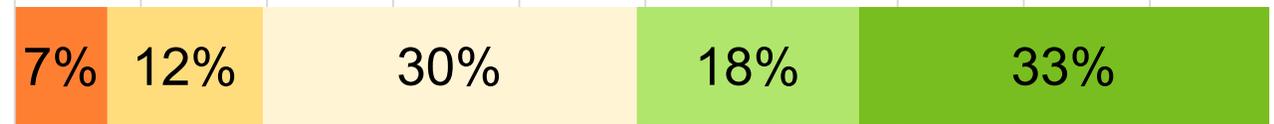- 5 to 15 additional minutes
- 15 to 30 additional minutes: 14%
- More than 30 additional minutes: 6%
- Not accept a longer commute: 31%
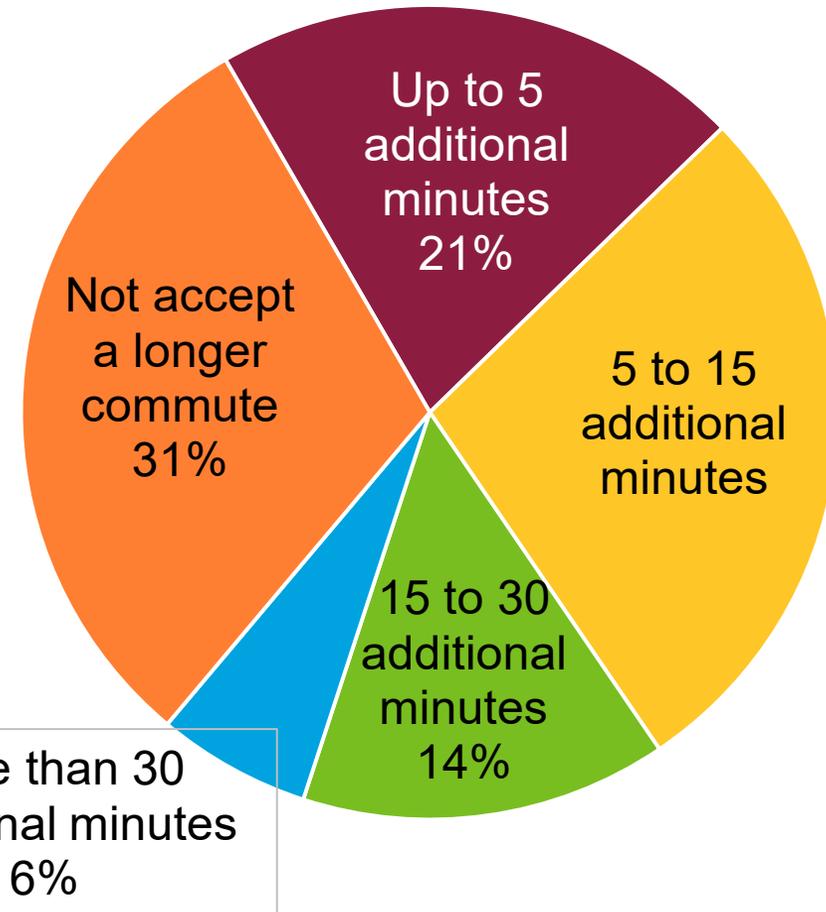
Autonomous Vehicles: Travel Impacts
(N=3,358)

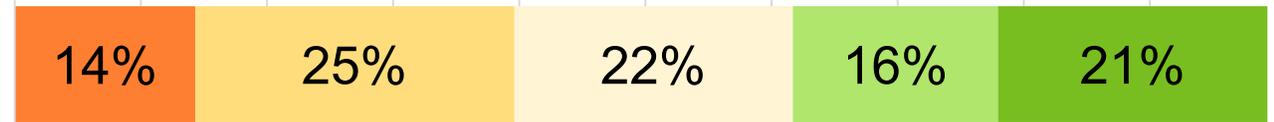**Legend:** ■ Very likely ■ Somewhat likely ■ Neutral ■ Somewhat unlikely ■ Very unlikely

Impact	Very likely	Somewhat likely	Neutral	Somewhat unlikely	Very unlikely
Making additional trips that are not made now	8%	19%	26%	21%	27%
Moving to a better location or home	7%	12%	30%	18%	33%
Making more long-distance road trips	14%	25%	22%	16%	21%
Traveling more in peak hours (due to multitasking)	13%	25%	25%	17%	20%

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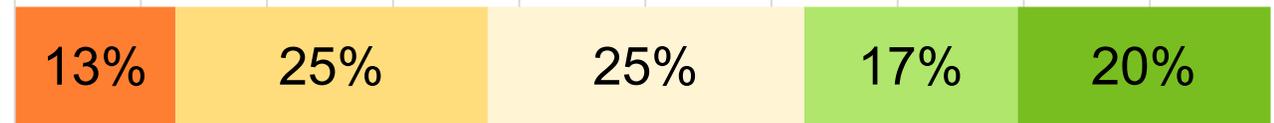
Autonomous Vehicles Regulations

Laws should be passed to require AVs to travel at 25 mph or less on city streets.
- Disagree: 32%
- Neutral: 34%
- Agree: 34%
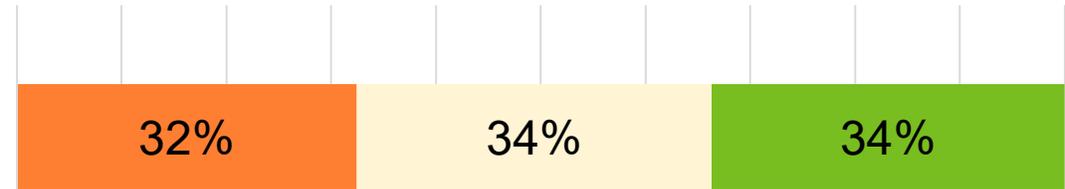
AVs should prioritize the safety of pedestrians and bicyclists on the road over that of passengers in the vehicle.
- Disagree: 24%
- Neutral: 33%
- Agree: 42%
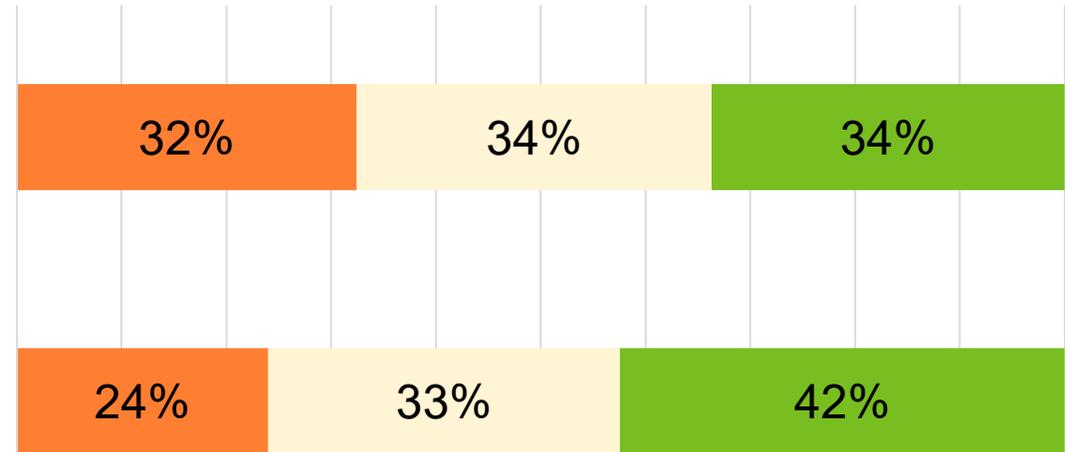
AVs should be allowed on the market only when they prove to be at least as safe as human drivers.
- Disagree: 10%
- Neutral: 11%
- Agree: 79%

Legend: ■ Disagree ■ Neutral ■ Agree

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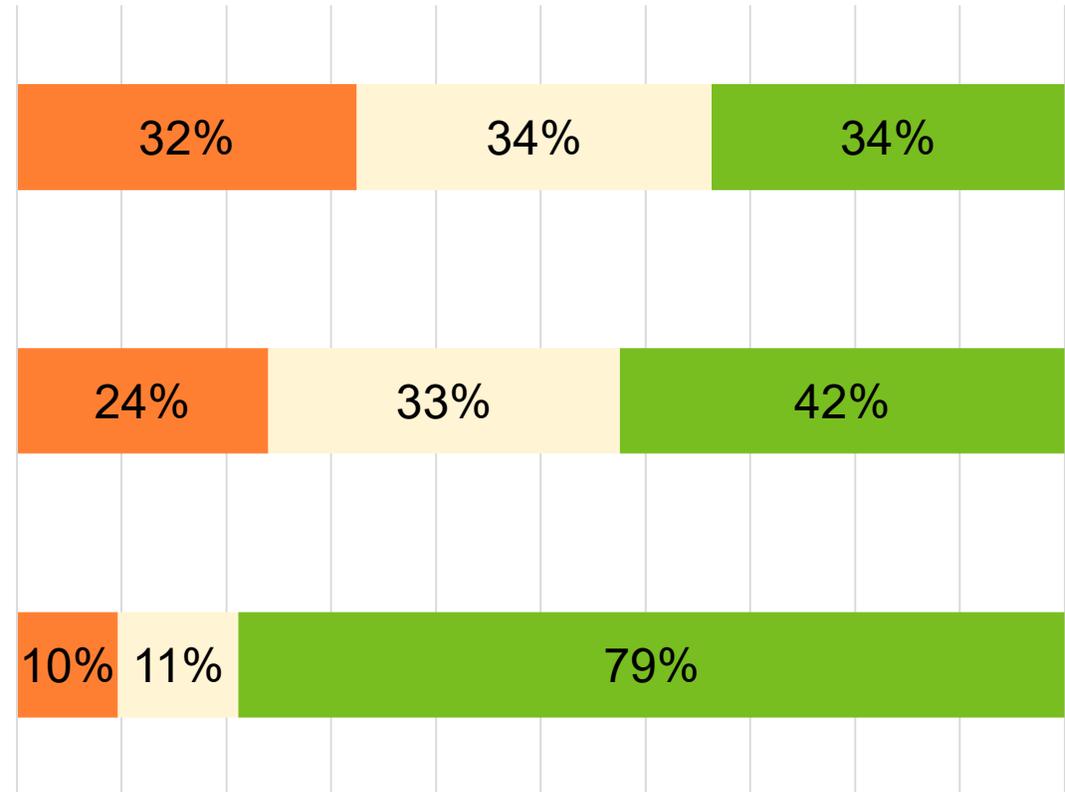
How AVs Shape the Future of Mobility?

N=3,356

Legend: Disagree | Neutral | Agree

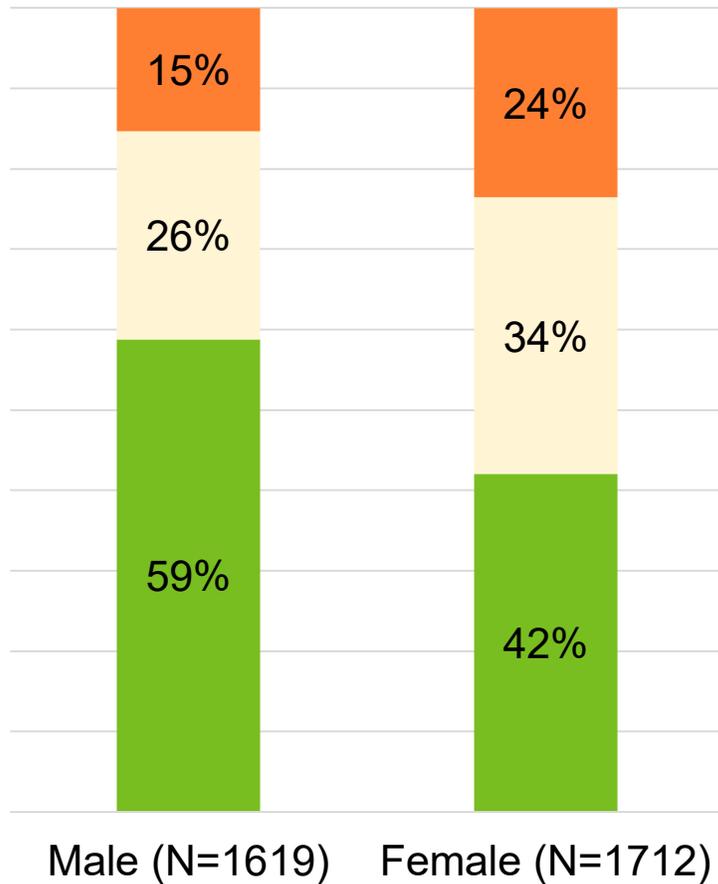| Statement	Disagree	Neutral	Agree
I would feel comfortable having an AV pick-up/drop-off children without adult supervision.	62%	21%	18%
I would send an AV to pick-up groceries/laundry/food orders by itself.	28%	23%	49%
AVs would save me time and money for parking by dropping me off and parking themselves.	16%	31%	53%

Photo: Brian Tietz for Transdev
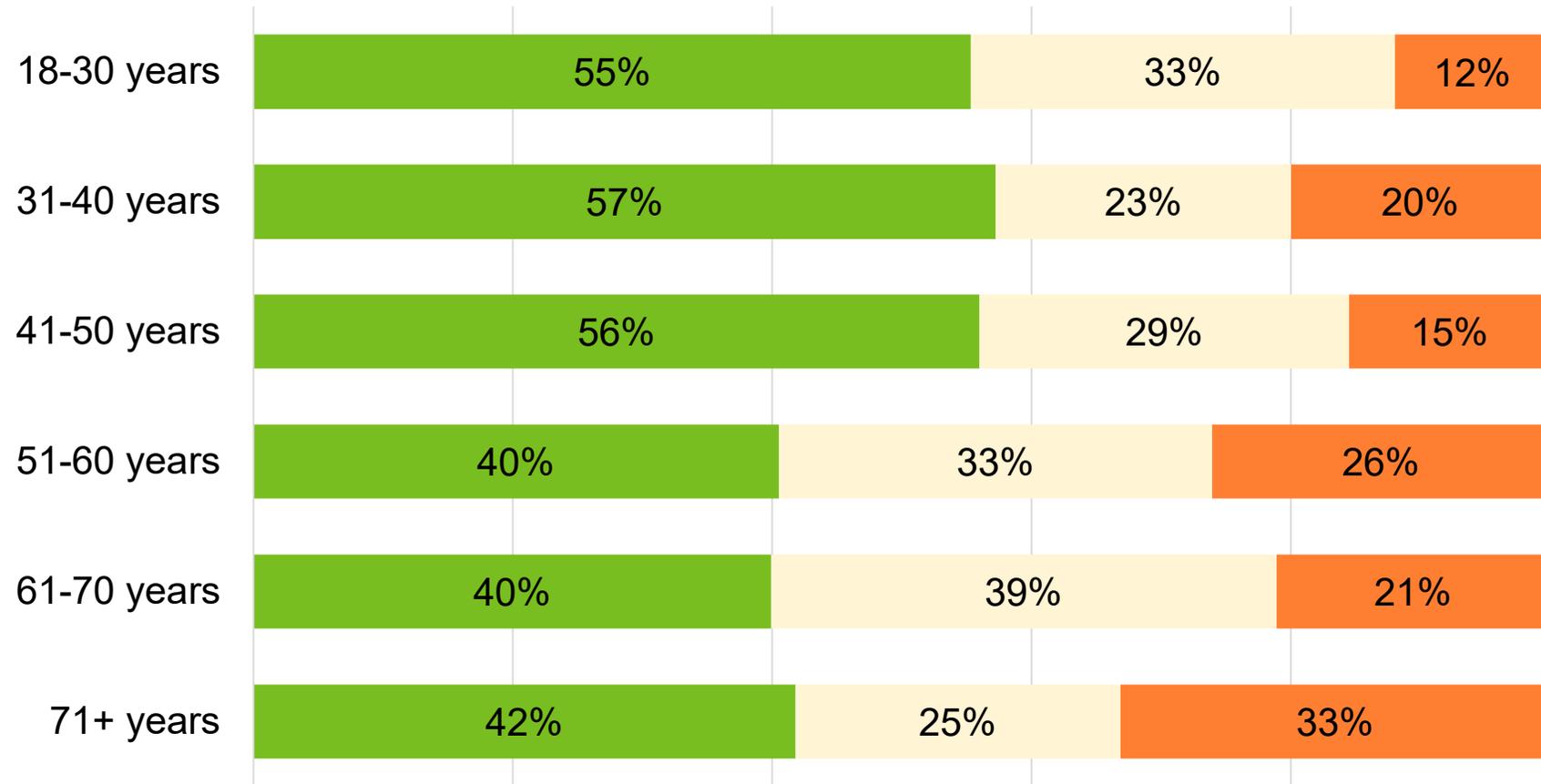
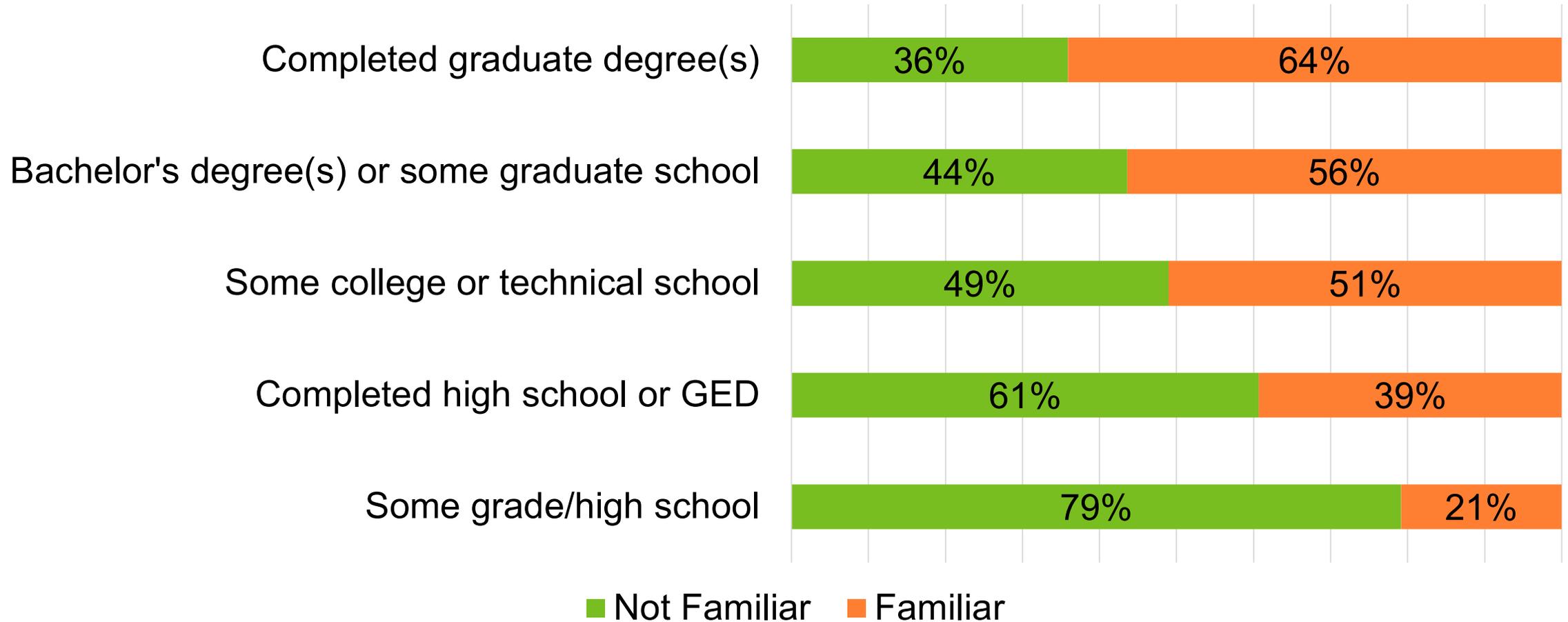Photo: Ross D. Franklin, STF / Associated Press

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Role of Age and Gender

Legend (left chart): Never ride an AV, Neutral, Ride AV
Legend (right chart): Ride AV, Neutral, Never ride an AV

Left chart — Male (N=1619): Never ride an AV 15%, Neutral 26%, Ride AV 59%
Left chart — Female (N=1712): Never ride an AV 24%, Neutral 34%, Ride AV 42%

Right chart:
- 18-30 years: Ride AV 55%, Neutral 33%, Never ride an AV 12%
- 31-40 years: Ride AV 57%, Neutral 23%, Never ride an AV 20%
- 41-50 years: Ride AV 56%, Neutral 29%, Never ride an AV 15%
- 51-60 years: Ride AV 40%, Neutral 33%, Never ride an AV 26%
- 61-70 years: Ride AV 40%, Neutral 39%, Never ride an AV 21%
- 71+ years: Ride AV 42%, Neutral 25%, Never ride an AV 33%

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Role of Tech-Savviness

Use of Private Ridehailing

Tech-savvy (N=2046)	7%	Familiar but not an user, 31%	Use it rarely, 44%	Use it monthly 12% / Use it weekly 7%
Not tech-savvy (N=1305)	Not familiar, 18%	Familiar but not an user, 40%	Use it rarely, 31%	Use it monthly 10%

Willingness to Buy AV

Tech-savvy (N=2019)	Never buy, 28%	Eventually buy, 65%	One of the first to buy, 7%
Not tech-savvy (N=1259)	Never buy, 53%	Eventually buy, 45%	

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Learning how to use new technologies is frustrating:
Disagree = Tech-savvy, Neutral or agree= Not tech-savvy

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Key Takeaways

We found:

- Role of attitudes in travel choices is substantial

- Remarkable consistency between geographic areas

- Ridehailing is under use by 16% at least monthly

- 38% indicated to never buy AVs (safety concerns)

- Sustainability and equity of MoD and AVs need attention

We recommend:

- Integrated mobility platforms

- Transit-MoD partnerships

- Regulations toward environment

- Cost competitiveness of sharing vs private modes
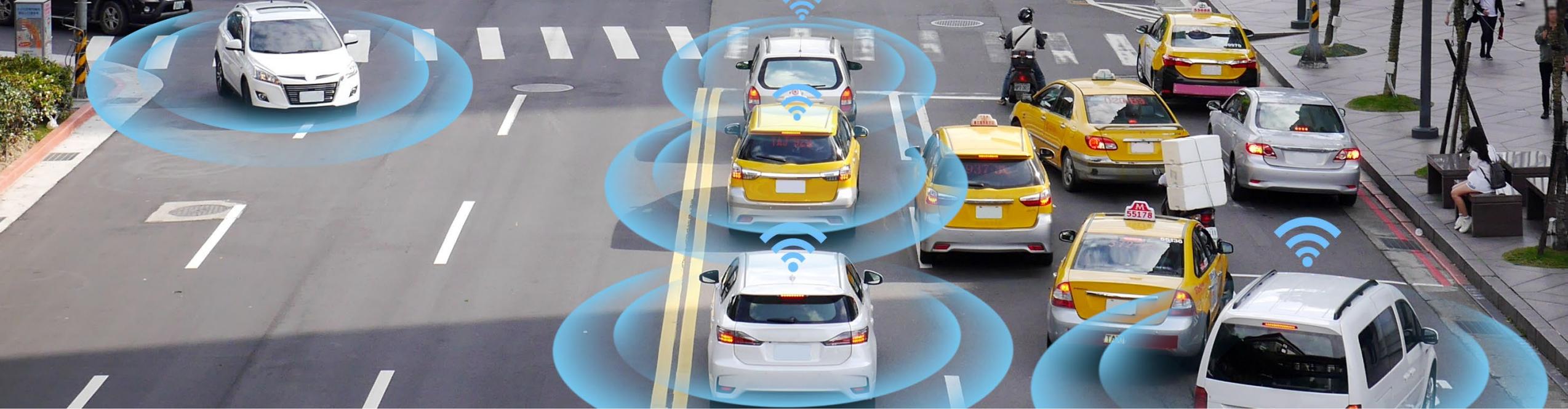
Thank you!

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